

### **REMARKS**

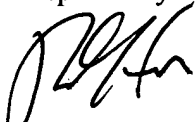
The Examiner has allowed all of the pending claims. This Communication is provided to comply with the requirements of 37 C.F.R. §§ 1.821-1.825 as set forth in the Action dated July 22, 2005. No new matter has been added.

### **CONCLUSION**

Applicants believe that the foregoing remarks fully respond to all outstanding matters for this application.

Should the Examiner have any remaining questions a telephone call to the undersigned attorney at 512-536-3081 is respectfully requested.

Respectfully submitted,

  
for: Gina N. Shishima  
Reg. No. 45,104  
Attorney for Applicants

FULBRIGHT & JAWORSKI L.L.P.  
600 Congress Avenue, Suite 2400  
Austin, Texas 78701  
(512) 474-5201  
(512) 536-4598 (facsimile)

Date: September 22, 2005

## **APPENDIX A**



## SEQUENCE LISTING

<110> ALDAZ, MARCELO C.  
BEDNAREK, ANDRZEJ

<120> WWOX: A PUTATIVE TUMOR SUPPRESSOR GENE MUTATED IN  
MULTIPLE CANCERS

<130> UTSC:671US

<140> 09/978,318

<141> 2001-10-15

<150> 60/240,277

<151> 2000-10-13

<160> 70

<170> PatentIn Ver. 2.1

<210> 1

<211> 2264

<212> DNA

<213> Human

<400> 1

```
gcagtgcgca ggcgtgagcg gtcggggcccc gacgcgcgcg ggtctcgttt ggagcgggag 60
tgagttcctg agcgagtggg cccggcagcg ggcgataggg gggccagggtg cctccacagt 120
cagccatggc agcgctgcgc tacgcggggc tggacgacac ggacagtgag gacgagctgc 180
ctccgggctg ggaggagaga accaccaagg acggctgggt ttactacgcc aatcacaccg 240
aggagaagac tcagtgggaa catccaaaaa ctggaaaaag aaaacgagtg gcaggagatt 300
tgccatacgg atgggaacaa gaaactgatg agaacggaca agtggtttttt gttgaccata 360
taaataaaaag aaccacctac ttggacccaa gactggcggt tactgtggat gataatccga 420
ccaagccaac caccgggcaa agatacgacg gcagcaccac tgccatggaa attctccagg 480
gccgggattt cactggcaaa gtggttgttg tcaactggagc taattcagga atagggttcg 540
aaaccgccaa gtcttttgcc ctccatggtg cacatgtgat cttggcctgc aggaacatgg 600
caagggcgag tgaagcagtg tcacgcattt tagaagaatg gcataaagcc aaggtagaag 660
caatgaccct ggacctcgct ctgctccgta gcgtgcagca ttttgctgaa gcattcaagg 720
ccaagaatgt gcctcttcat gtgcttgtgt gcaacgcagc aacttttgct ctacctgga 780
gtctcaccaa agatggcctg gagaccacct ttcaagtga tcatctgggg cacttctacc 840
ttgtccagct cctccaggat gttttgtgcc gctcagctcc tgcccgtgtc attgtggtct 900
cctcagagtc ccatcgattt acagatatta acgactcctt gggaaaactg gacttcagtc 960
gcctctctcc aacaaaaaac gactattggg cgatgctggc ttataacagg tccaagctct 1020
gcaacatcct cttctccaac gagctgcacc gtcgcctctc cccacgcggg gtcacgtcga 1080
acgcagtgca tcctggaaat atgatgtact ccaacattca tcgcagctgg tgggtgtaca 1140
cactgctgtt taccttggcg aggcctttca ccaagtccat gcaacagggg gctgccacca 1200
ccgtgtactg tgctgctgtc ccagaactgg agggctctggg agggatgtac ttcaacaact 1260
gctgccgctg catgccctca ccagaagctc agagcgaaga gacggcccgg accctgtggg 1320
cgctcagcga gaggtgatc caagaacggc ttggcagcca gtccggctaa gtggagctca 1380
gagcggatgg gcacacacac ccgccctgtg tgtgtccctt cacgcaagtg ccagggtcgg 1440
gccctttcca aatgtccctc caacacagat ccgcaagagt aaaggaaata agagcagtc 1500
caacagagtg aaaaatctta agtaccatg ggaagcaggg aattcctggg gtaaagtatc 1560
acttttctgg ggctgggcta ggcataggtc tctttgcttt ctggtggtgg cctgtttgaa 1620
agtaaaaacc tgcttggtgt gtaggttccg tatctccctg gagaagcacc agcaattctc 1680
tttcttttac tgttatagaa tagcctgagg tcccctcgct ccatccagct accaccacgg 1740
ccaccactgc agccgggggc tggccttctc ctacttaggg aagaaaaagc aagtgttcac 1800
```

```

tgctccttgc tgcattgac caggagataa ttgtttcatt catcctgacc aagactgagc 1860
cagcttagca actgctgggg agacaaatct cagaaccttg tcccagccag tgaggatgac 1920
agtacacccc agaggagta gaatacgcag aactaccagg tggcaaagta cttgtcatag 1980
actcctttgc taatgctatg caaaaaattc tttagagatt ataacaaatt tttcaaata 2040
ttccttagat accttgaaag gcaggaaggg aagcgtatat acttaagaat acacaggata 2100
ttttgggggg cagagaataa aacgttagtt aatccctttg tctgtcaatc acagtctcag 2160
ttctcttgct ttcacattgt acttaaacct cctgctgtgc ctcgcctcct atgcttaata 2220
aaagaacatg cttgaatatc aaaaaaaaaa aaaaaaaaaa aaaa 2264

```

<210> 2  
 <211> 414  
 <212> PRT  
 <213> Human

```

<400> 2
Met Ala Ala Leu Arg Tyr Ala Gly Leu Asp Asp Thr Asp Ser Glu Asp
  1             5             10             15

Glu Leu Pro Pro Gly Trp Glu Glu Arg Thr Thr Lys Asp Gly Trp Val
          20             25             30

Tyr Tyr Ala Asn His Thr Glu Glu Lys Thr Gln Trp Glu His Pro Lys
  35             40             45

Thr Gly Lys Arg Lys Arg Val Ala Gly Asp Leu Pro Tyr Gly Trp Glu
  50             55             60

Gln Glu Thr Asp Glu Asn Gly Gln Val Phe Phe Val Asp His Ile Asn
  65             70             75             80

Lys Arg Thr Thr Tyr Leu Asp Pro Arg Leu Ala Phe Thr Val Asp Asp
          85             90             95

Asn Pro Thr Lys Pro Thr Thr Arg Gln Arg Tyr Asp Gly Ser Thr Thr
  100            105            110

Ala Met Glu Ile Leu Gln Gly Arg Asp Phe Thr Gly Lys Val Val Val
  115            120            125

Val Thr Gly Ala Asn Ser Gly Ile Gly Phe Glu Thr Ala Lys Ser Phe
  130            135            140

Ala Leu His Gly Ala His Val Ile Leu Ala Cys Arg Asn Met Ala Arg
  145            150            155            160

Ala Ser Glu Ala Val Ser Arg Ile Leu Glu Glu Trp His Lys Ala Lys
          165            170            175

Val Glu Ala Met Thr Leu Asp Leu Ala Leu Leu Arg Ser Val Gln His
          180            185            190

Phe Ala Glu Ala Phe Lys Ala Lys Asn Val Pro Leu His Val Leu Val
          195            200            205

Cys Asn Ala Ala Thr Phe Ala Leu Pro Trp Ser Leu Thr Lys Asp Gly
  210            215            220

```

Leu Glu Thr Thr Phe Gln Val Asn His Leu Gly His Phe Tyr Leu Val  
 225 230 235 240  
 Gln Leu Leu Gln Asp Val Leu Cys Arg Ser Ala Pro Ala Arg Val Ile  
 245 250 255  
 Val Val Ser Ser Glu Ser His Arg Phe Thr Asp Ile Asn Asp Ser Leu  
 260 265 270  
 Gly Lys Leu Asp Phe Ser Arg Leu Ser Pro Thr Lys Asn Asp Tyr Trp  
 275 280 285  
 Ala Met Leu Ala Tyr Asn Arg Ser Lys Leu Cys Asn Ile Leu Phe Ser  
 290 295 300  
 Asn Glu Leu His Arg Arg Leu Ser Pro Arg Gly Val Thr Ser Asn Ala  
 305 310 315 320  
 Val His Pro Gly Asn Met Met Tyr Ser Asn Ile His Arg Ser Trp Trp  
 325 330 335  
 Val Tyr Thr Leu Leu Phe Thr Leu Ala Arg Pro Phe Thr Lys Ser Met  
 340 345 350  
 Gln Gln Gly Ala Ala Thr Thr Val Tyr Cys Ala Ala Val Pro Glu Leu  
 355 360 365  
 Glu Gly Leu Gly Gly Met Tyr Phe Asn Asn Cys Cys Arg Cys Met Pro  
 370 375 380  
 Ser Pro Glu Ala Gln Ser Glu Glu Thr Ala Arg Thr Leu Trp Ala Leu  
 385 390 395 400  
 Ser Glu Arg Leu Ile Gln Glu Arg Leu Gly Ser Gln Ser Gly  
 405 410

<210> 3  
 <211> 26  
 <212> DNA  
 <213> Homo sapiens

<400> 3  
 acggtggtgg cagctccctg ttgttg

26

<210> 4  
 <211> 29  
 <212> DNA  
 <213> Homo sapiens

<400> 4  
 acggtggtgg cagctccctg ttgcgatgg

29

<210> 5  
 <211> 33

<212> DNA  
 <213> Homo sapiens  
  
 <400> 5  
 acggtggtgg cagctccctg ttgacattct tgg 33  
  
 <210> 6  
 <211> 32  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 6  
 acggtggtgg cagctccctg ttgccattct tc 32  
  
 <210> 7  
 <211> 30  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 7  
 acggtggtgg cagctccctg ttgctattcc 30  
  
 <210> 8  
 <211> 33  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 8  
 tgggtggcagc tcctgttgt caacaaaaaa cac 33  
  
 <210> 9  
 <211> 27  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 9  
 acggtggtgg cagctccctg ttgctcc 27  
  
 <210> 10  
 <211> 19  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 10  
 tcgcagctgg tgggtgtac 19  
  
 <210> 11  
 <211> 21  
 <212> DNA  
 <213> Homo sapiens

<400> 11	
agctccctgt tgcattggact t	21
<210> 12	
<211> 22	
<212> DNA	
<213> Homo sapiens	
<400> 12	
tgagtgtgt ctccatgttt ga	22
<210> 13	
<211> 22	
<212> DNA	
<213> Homo sapiens	
<400> 13	
tctgctcccc acctctaagt tg	22
<210> 14	
<211> 21	
<212> DNA	
<213> Homo sapiens	
<400> 14	
aggcagtgcg caggcgtgag c	21
<210> 15	
<211> 22	
<212> DNA	
<213> Homo sapiens	
<400> 15	
cagccctggc acttgctga gg	22
<210> 16	
<211> 22	
<212> DNA	
<213> Homo sapiens	
<400> 16	
tgcgtgagg gacacacaca gg	22
<210> 17	
<211> 23	
<212> DNA	
<213> Homo sapiens	
<400> 17	
gagttcctga gcgagtgac ccg	23

<210> 18  
 <211> 30  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 18  
 tagtttttat tattattagt ttttattatt 30  
  
 <210> 19  
 <211> 22  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 19  
 aatactacat cctaaacaac aa 22  
  
 <210> 20  
 <211> 30  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 20  
 agttttttatt attatgagtt tttattaaat 30  
  
 <210> 21  
 <211> 20  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> modified\_base  
 <222> (3)..(5)  
 <223> R = A OR G  
  
 <400> 21  
 cccrcaata ctacatccta 20  
  
 <210> 22  
 <211> 20  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> modified\_base  
 <222> (11)  
 <223> Y = C OR T/U  
  
 <400> 22  
 gggatgaggt ygttttggtt 20  
  
 <210> 23



<211> 24  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 23  
 tcataaatct ctattaaaca acaa 24  
  
 <210> 24  
 <211> 21  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> modified\_base  
 <222> (2)  
 <223> Y = C OR T/U  
  
 <400> 24  
 gygtagtggt gtattttgaa t 21  
  
 <210> 25  
 <211> 28  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 25  
 tcacaatctc tattatatat tttaacta 28  
  
 <210> 26  
 <211> 19  
 <212> DNA  
 <213> Homo sapiens  
  
 <220>  
 <221> modified\_base  
 <222> (9)..(11)  
 <223> R = A OR G  
  
 <400> 26  
 tcctccccc rcaaataac 19  
  
 <210> 27  
 <211> 30  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 27  
 ttattattat gagtttttat taaataatag 30  
  
 <210> 28  
 <211> 1625  
 <212> DNA

<213> Homo sapiens

<400> 28

```
ggcacgagggc agtgcgcgagg cgtgagcggt cgggccccga cgcgcgcggg tctcgtttgg 60
agcgggagtg agttcctgag cgagtggacc cggcagcggg cgataggggg gccaggtgcc 120
tccacagtca gccatggcag cgctgcgcta cgcggggctg gacgacacgg acagtgagga 180
cgagctgcct ccgggctggg aggagagaac caccaaggac ggctggggtt actacgcca 240
tcacaccgag gagaagactc agtgggaaca tccaaaaact ggaaaaagaa aacgagtggc 300
aggagatttg ccatacggat gggaacaaga aactgatgag aacggacaag tgttttttgt 360
tgaccatata aataaaagaa ccacctactt ggacccaaga ctggcgttta ctgtggatga 420
taatccgacc aagccaacca ccgggcaaag atacgacggc agcaccactg ccattggaat 480
tctccagggc cgggatttca ctggcaaagt ggttggtggtc actggagcta attcaggaat 540
agcaacaggg agctgccacc accgtgtact gtgctgctgt cccagaactg gaggggtctgg 600
gagggatgta cttcaacaac tgctgccgt gcatgccctc accagaagct cagagcgaag 660
agacggcccg gacctgtgg gcgctcagcg agaggctgat ccaagaacgg cttggcagcc 720
agtccggcta agtggagctc agagcggatg ggcacacaca ccgcccctgt gtgtgtcccc 780
tcacgcaagt gccagggtg ggcccccttc aaatgtccct ccaacacaga tccgcaagag 840
taaaggaaat aagagcagtc acaacagagt gaaaaatctt aagtaccaat gggaagcagg 900
gaattccttg ggtaaagtat cacttttctg gggctgggct aggcataagg ctctttgctt 960
tctggtggtg gcctgtttga aagtaaaaac ctgcttggtg tgtaggttcc gtatctccct 1020
ggagaagcac cagcaattct ctttctttta ctgttataga atagcctgag gtccccctcg 1080
cccatccagc taccaccacg gccaccactg cagccggggg ctggccttct cctacttagg 1140
gaagaaaaag caagtgttca ctgctccttg ctgcattgat ccaggagata attgtttcat 1200
tcaccttgac caagactgag ccagcttagc aactgctggg gagacaaatc tcagaacctt 1260
gtcccagcca gtgaggatga cagtgcacc cagagggagt agaatacgca gaactaccag 1320
gtggcaaagt acttgtcata gactcctttg ctaatgctat gcaaaaaatt ctttagagat 1380
tataacaaat ttttcaaate attccttaga taccttgaaa ggcaggaagg gaagcgtata 1440
tacttaagaa tacacaggat attttggggg gcagagaata aaacgttagt taatcccttt 1500
gtctgtcaat cacagtctca gttctcttgc tttcacattg tacttaaacc tctgctgtg 1560
cctcgcatcc tatgcttaat aaaagaacat gcttgaatat caaaaaaaaa aaaaaaaaaa 1620
aaaaa 1625
```

<210> 29

<211> 23

<212> DNA

<213> Homo sapiens

<400> 29

```
tagtggtgta ttttgaatag tag 23
```

<210> 30

<211> 1625

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (134)..(1069)

<400> 30

```
ggcacgagggc agtgcgcgagg cgtgagcggt cgggccccga cgcgcgcggg tctcgtttgg 60
agcgggagtg agttcctgag cgagtggacc cggcagcggg cgataggggg gccaggtgcc 120
tccacagtca gcc atg gca gcg ctg cgc tac gcg ggg ctg gac gac acg 169
```

Met	Ala	Ala	Leu	Arg	Tyr	Ala	Gly	Leu	Asp	Asp	Thr					
1					5						10					
gac	agt	gag	gac	gag	ctg	cct	ccg	ggc	tgg	gag	gag	aga	acc	acc	aag	217
Asp	Ser	Glu	Asp	Glu	Leu	Pro	Pro	Gly	Trp	Glu	Glu	Arg	Thr	Thr	Lys	
		15					20					25				
gac	ggc	tgg	gtt	tac	tac	gcc	aat	cac	acc	gag	gag	aag	act	cag	tgg	265
Asp	Gly	Trp	Val	Tyr	Tyr	Ala	Asn	His	Thr	Glu	Glu	Lys	Thr	Gln	Trp	
	30					35					40					
gaa	cat	cca	aaa	act	gga	aaa	aga	aaa	cga	gtg	gca	gga	gat	ttg	cca	313
Glu	His	Pro	Lys	Thr	Gly	Lys	Arg	Lys	Arg	Val	Ala	Gly	Asp	Leu	Pro	
	45				50					55					60	
tac	gga	tgg	gaa	caa	gaa	act	gat	gag	aac	gga	caa	gtg	ttt	ttt	gtt	361
Tyr	Gly	Trp	Glu	Gln	Glu	Thr	Asp	Glu	Asn	Gly	Gln	Val	Phe	Phe	Val	
				65					70					75		
gac	cat	ata	aat	aaa	aga	acc	acc	tac	ttg	gac	cca	aga	ctg	gcg	ttt	409
Asp	His	Ile	Asn	Lys	Arg	Thr	Thr	Tyr	Leu	Asp	Pro	Arg	Leu	Ala	Phe	
			80					85					90			
act	gtg	gat	gat	aat	ccg	acc	aag	cca	acc	acc	cgg	caa	aga	tac	gac	457
Thr	Val	Asp	Asp	Asn	Pro	Thr	Lys	Pro	Thr	Thr	Arg	Gln	Arg	Tyr	Asp	
		95					100					105				
ggc	agc	acc	act	gcc	atg	gaa	att	ctc	cag	ggc	cgg	gat	ttc	act	ggc	505
Gly	Ser	Thr	Thr	Ala	Met	Glu	Ile	Leu	Gln	Gly	Arg	Asp	Phe	Thr	Gly	
	110					115					120					
aaa	gtg	gtt	gtg	gtc	act	gga	gct	aat	tca	gga	ata	gca	aca	ggg	agc	553
Lys	Val	Val	Val	Val	Thr	Gly	Ala	Asn	Ser	Gly	Ile	Ala	Thr	Gly	Ser	
	125				130					135					140	
tgc	cac	cac	cgt	gta	ctg	tgc	tgc	tgt	ccc	aga	act	gga	ggg	tct	ggg	601
Cys	His	His	Arg	Val	Leu	Cys	Cys	Cys	Pro	Arg	Thr	Gly	Gly	Ser	Gly	
				145					150					155		
agg	gat	gta	ctt	caa	caa	ctg	ctg	ccg	ctg	cat	gcc	ctc	acc	aga	agc	649
Arg	Asp	Val	Leu	Gln	Gln	Leu	Leu	Pro	Leu	His	Ala	Leu	Thr	Arg	Ser	
			160					165					170			
tca	gag	cga	aga	gac	ggc	ccg	gac	cct	gtg	ggc	gct	cag	cga	gag	gct	697
Ser	Glu	Arg	Arg	Asp	Gly	Pro	Asp	Pro	Val	Gly	Ala	Gln	Arg	Glu	Ala	
		175					180					185				
gat	cca	aga	acg	gct	tgg	cag	cca	gtc	cgg	cta	agt	gga	gct	cag	agc	745
Asp	Pro	Arg	Thr	Ala	Trp	Gln	Pro	Val	Arg	Leu	Ser	Gly	Ala	Gln	Ser	
	190					195					200					
gga	tgg	gca	cac	aca	ccc	gcc	ctg	tgt	gtg	tcc	cct	cac	gca	agt	gcc	793
Gly	Trp	Ala	His	Thr	Pro	Ala	Leu	Cys	Val	Ser	Pro	His	Ala	Ser	Ala	
	205				210					215					220	
agg	gct	ggg	ccc	ctt	cca	aat	gtc	cct	cca	aca	cag	atc	cgc	aag	agt	841
Arg	Ala	Gly	Pro	Leu	Pro	Asn	Val	Pro	Pro	Thr	Gln	Ile	Arg	Lys	Ser	

225	230	235	
aaa gga aat aag agc agt cac aac aga gtg aaa aat ctt aag tac caa			889
Lys Gly Asn Lys Ser Ser His Asn Arg Val Lys Asn Leu Lys Tyr Gln			
240	245	250	
tgg gaa gca ggg aat tcc tgg ggt aaa gta tca ctt ttc tgg ggc tgg			937
Trp Glu Ala Gly Asn Ser Trp Gly Lys Val Ser Leu Phe Trp Gly Trp			
255	260	265	
gct agg cat agg tct ctt tgc ttt ctg gtg gtg gcc tgt ttg aaa gta			985
Ala Arg His Arg Ser Leu Cys Phe Leu Val Val Ala Cys Leu Lys Val			
270	275	280	
aaa acc tgc ttg gtg tgt agg ttc cgt atc tcc ctg gag aag cac cag			1033
Lys Thr Cys Leu Val Cys Arg Phe Arg Ile Ser Leu Glu Lys His Gln			
285	290	295	300
caa ttc tct ttc ttt tac tgt tat aga ata gcc tga ggtccccctcg			1079
Gln Phe Ser Phe Phe Tyr Cys Tyr Arg Ile Ala			
305	310		
tcccatccag ctaccaccac ggccaccact gcagccgggg gctggccttc tcctacttag			1139
ggaagaaaaa gcaagtgttc actgctcctt gctgcattga tccaggagat aattgtttca			1199
ttcatcctga ccaagactga gccagcttag caactgctgg ggagacaaat ctcagaacct			1259
tgtcccagcc agtgaggatg acagtgcacac ccagagggag tagaatacgc agaactacca			1319
ggtggcaaag tacttgtcat agactccttt gctaattgcta tgcaaaaaat tcttttagaga			1379
ttataacaaa tttttcaaat cattccttag ataccttgaa aggcaggaag ggaagcgtat			1439
atacttaaga atacacagga tattttgggg ggcagagaat aaaacgtag ttaatccctt			1499
tgtctgtcaa tcacagtctc agttctcttg ctttcacatt gtacttaaac ctctgctgt			1559
gcctcgcac ctatgcttaa taaaagaaca tgcttgaata tcaaaaaaaaa aaaaaaaaaa			1619
aaaaaa			1625

<210> 31  
 <211> 311  
 <212> PRT  
 <213> Homo sapiens

<400> 31  
 Met Ala Ala Leu Arg Tyr Ala Gly Leu Asp Asp Thr Asp Ser Glu Asp  
 1 5 10 15  
 Glu Leu Pro Pro Gly Trp Glu Glu Arg Thr Thr Lys Asp Gly Trp Val  
 20 25 30  
 Tyr Tyr Ala Asn His Thr Glu Glu Lys Thr Gln Trp Glu His Pro Lys  
 35 40 45  
 Thr Gly Lys Arg Lys Arg Val Ala Gly Asp Leu Pro Tyr Gly Trp Glu  
 50 55 60

Gln Glu Thr Asp Glu Asn Gly Gln Val Phe Phe Val Asp His Ile Asn  
 65 70 75 80  
 Lys Arg Thr Thr Tyr Leu Asp Pro Arg Leu Ala Phe Thr Val Asp Asp  
 85 90 95  
 Asn Pro Thr Lys Pro Thr Thr Arg Gln Arg Tyr Asp Gly Ser Thr Thr  
 100 105 110  
 Ala Met Glu Ile Leu Gln Gly Arg Asp Phe Thr Gly Lys Val Val Val  
 115 120 125  
 Val Thr Gly Ala Asn Ser Gly Ile Ala Thr Gly Ser Cys His His Arg  
 130 135 140  
 Val Leu Cys Cys Cys Pro Arg Thr Gly Gly Ser Gly Arg Asp Val Leu  
 145 150 155 160  
 Gln Gln Leu Leu Pro Leu His Ala Leu Thr Arg Ser Ser Glu Arg Arg  
 165 170 175  
 Asp Gly Pro Asp Pro Val Gly Ala Gln Arg Glu Ala Asp Pro Arg Thr  
 180 185 190  
 Ala Trp Gln Pro Val Arg Leu Ser Gly Ala Gln Ser Gly Trp Ala His  
 195 200 205  
 Thr Pro Ala Leu Cys Val Ser Pro His Ala Ser Ala Arg Ala Gly Pro  
 210 215 220  
 Leu Pro Asn Val Pro Pro Thr Gln Ile Arg Lys Ser Lys Gly Asn Lys  
 225 230 235 240  
 Ser Ser His Asn Arg Val Lys Asn Leu Lys Tyr Gln Trp Glu Ala Gly  
 245 250 255  
 Asn Ser Trp Gly Lys Val Ser Leu Phe Trp Gly Trp Ala Arg His Arg  
 260 265 270  
 Ser Leu Cys Phe Leu Val Val Ala Cys Leu Lys Val Lys Thr Cys Leu  
 275 280 285  
 Val Cys Arg Phe Arg Ile Ser Leu Glu Lys His Gln Gln Phe Ser Phe  
 290 295 300  
 Phe Tyr Cys Tyr Arg Ile Ala  
 305 310

<210> 32  
 <211> 1732  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (134) .. (838)

<400> 32  
 ggcacgaggc agtgcgagc cgtgagcggg cgggccccga cgcgcgcggg tctcgtttgg 60  
 agcgggagtg agttcctgag cgagtggacc cggcagcggg cgataggggg gccaggtgcc 120  
 tccacagtca gcc atg gca gcg ctg cgc tac gcg ggg ctg gac gac acg 169  
 Met Ala Ala Leu Arg Tyr Ala Gly Leu Asp Asp Thr  
 1 5 10  
 gac agt gag gac gag ctg cct ccg ggc tgg gag gag aga acc acc aag 217  
 Asp Ser Glu Asp Glu Leu Pro Pro Gly Trp Glu Glu Arg Thr Thr Lys  
 15 20 25

gac ggc tgg gtt tac tac gcc aat cac acc gag gag aag act cag tgg	265
Asp Gly Trp Val Tyr Tyr Ala Asn His Thr Glu Glu Lys Thr Gln Trp	
30 35 40	
gaa cat cca aaa act gga aaa aga aaa cga gtg gca gga gat ttg cca	313
Glu His Pro Lys Thr Gly Lys Arg Lys Arg Val Ala Gly Asp Leu Pro	
45 50 55 60	
tac gga tgg gaa caa gaa act gat gag aac gga caa gtg ttt ttt gtt	361
Tyr Gly Trp Glu Gln Glu Thr Asp Glu Asn Gly Gln Val Phe Phe Val	
65 70 75	
gac cat ata aat aaa aga acc acc tac ttg gac cca aga ctg gcg ttt	409
Asp His Ile Asn Lys Arg Thr Thr Tyr Leu Asp Pro Arg Leu Ala Phe	
80 85 90	
act gtg gat gat aat ccg acc aag cca acc acc cgg caa aga tac gac	457
Thr Val Asp Asp Asn Pro Thr Lys Pro Thr Thr Arg Gln Arg Tyr Asp	
95 100 105	
ggc agc acc act gcc atg gaa att ctc cag ggc cgg gat ttc act ggc	505
Gly Ser Thr Thr Ala Met Glu Ile Leu Gln Gly Arg Asp Phe Thr Gly	
110 115 120	
aaa gtg gtt gtg gtc act gga gct aat tca gga ata ggg ttc gaa acc	553
Lys Val Val Val Val Thr Gly Ala Asn Ser Gly Ile Gly Phe Glu Thr	
125 130 135 140	
gcc aag tct ttt gcc ctc cat ggt gca cat gtg atc ttg gcc tgc agg	601
Ala Lys Ser Phe Ala Leu His Gly Ala His Val Ile Leu Ala Cys Arg	
145 150 155	
aac atg gca agg gcg agt gaa gca gtg tca cgc att tta gaa gaa tgg	649
Asn Met Ala Arg Ala Ser Glu Ala Val Ser Arg Ile Leu Glu Glu Trp	
160 165 170	
caa cag gga gct gcc acc acc gtg tac tgt gct gct gtc cca gaa ctg	697
Gln Gln Gly Ala Ala Thr Thr Val Tyr Cys Ala Ala Val Pro Glu Leu	
175 180 185	
gag ggt ctg gga ggg atg tac ttc aac aac tgc tgc cgc tgc atg ccc	745
Glu Gly Leu Gly Gly Met Tyr Phe Asn Asn Cys Cys Arg Cys Met Pro	
190 195 200	
tca cca gaa gct cag agc gaa gag acg gcc cgg acc ctg tgg gcg ctc	793
Ser Pro Glu Ala Gln Ser Glu Glu Thr Ala Arg Thr Leu Trp Ala Leu	
205 210 215 220	
agc gag agg ctg atc caa gaa cgg ctt ggc agc cag tcc ggc taa	838
Ser Glu Arg Leu Ile Gln Glu Arg Leu Gly Ser Gln Ser Gly	
225 230 235	
gtggagctca gagggatgg gcacacacac ccgcctgtg tgtgtccct cagcaagtg	898
ccagggctgg gcccttcca aatgtccctc caacacagat ccgcaagagt aaaggaaata	958
agagcagtca caacagagtg aaaaatctta agtaccaatg ggaagcaggg aattcctggg	1018

gtaaagtatc acttttctgg ggctgggcta ggcataaggtc tctttgcttt ctggtggtgg 1078  
 cctgtttgaa agtaaaaacc tgcttggtgt gtaggttccg tatctccctg gagaagcacc 1138  
 agcaattctc tttcttttac tgttatagaa tagcctgagg tcccctcgtc ccatccagct 1198  
 accaccacgg ccaccactgc agccgggggc tggccttctc ctacttaggg aagaaaaagc 1258  
 aagtgttcac tgctccttgc tgcattgatac caggagataa ttgtttcatt catcctgacc 1318  
 aagactgagc cagcttagca actgctgggg agacaaatct cagaaccttg tcccagccag 1378  
 tgaggatgac agtgacaccc agaggagta gaatacgag aactaccagg tggcaaagta 1438  
 cttgtcatag actcctttgc taatgctatg caaaaaattc tttagagatt ataacaaatt 1498  
 tttcaaataca ttccttagat accttgaaag gcaggaaggg aagcgtatat acttaagaat 1558  
 acacaggata ttttgggggg cagagaataa aacgttagtt aatccctttg tctgtcaatc 1618  
 acagtctcag ttctcttgc ttcacattgt acttaaacct cctgctgtgc ctgcgcatcct 1678  
 atgcttaata aaagaacatg cttgaatatc aaaaaaaaaa aaaaaaaaaa aaaa 1732

<210> 33  
 <211> 234  
 <212> PRT  
 <213> Homo sapiens

<400> 33  
 Met Ala Ala Leu Arg Tyr Ala Gly Leu Asp Asp Thr Asp Ser Glu Asp  
 1 5 10 15  
 Glu Leu Pro Pro Gly Trp Glu Glu Arg Thr Thr Lys Asp Gly Trp Val  
 20 25 30  
 Tyr Tyr Ala Asn His Thr Glu Glu Lys Thr Gln Trp Glu His Pro Lys  
 35 40 45  
 Thr Gly Lys Arg Lys Arg Val Ala Gly Asp Leu Pro Tyr Gly Trp Glu  
 50 55 60  
 Gln Glu Thr Asp Glu Asn Gly Gln Val Phe Phe Val Asp His Ile Asn  
 65 70 75 80  
 Lys Arg Thr Thr Tyr Leu Asp Pro Arg Leu Ala Phe Thr Val Asp Asp  
 85 90 95  
 Asn Pro Thr Lys Pro Thr Thr Arg Gln Arg Tyr Asp Gly Ser Thr Thr  
 100 105 110  
 Ala Met Glu Ile Leu Gln Gly Arg Asp Phe Thr Gly Lys Val Val Val  
 115 120 125  
 Val Thr Gly Ala Asn Ser Gly Ile Gly Phe Glu Thr Ala Lys Ser Phe  
 130 135 140  
 Ala Leu His Gly Ala His Val Ile Leu Ala Cys Arg Asn Met Ala Arg  
 145 150 155 160  
 Ala Ser Glu Ala Val Ser Arg Ile Leu Glu Glu Trp Gln Gln Gly Ala  
 165 170 175  
 Ala Thr Thr Val Tyr Cys Ala Ala Val Pro Glu Leu Glu Gly Leu Gly  
 180 185 190  
 Gly Met Tyr Phe Asn Asn Cys Cys Arg Cys Met Pro Ser Pro Glu Ala

	195		200		205										
Gln	Ser	Glu	Glu	Thr	Ala	Arg	Thr	Leu	Trp	Ala	Leu	Ser	Glu	Arg	Leu
	210					215					220				
Ile	Gln	Glu	Arg	Leu	Gly	Ser	Gln	Ser	Gly						
225					230										

<210> 34  
 <211> 19  
 <212> DNA  
 <213> Homo sapiens

<400> 34  
 agcaggcgtg agcggtcgg 19

<210> 35  
 <211> 23  
 <212> DNA  
 <213> Homo sapiens

<400> 35  
 actggatttc agcttcgtgg tcg 23

<210> 36  
 <211> 20  
 <212> DNA  
 <213> Homo sapiens

<400> 36  
 tccgtgggct gtgcagggtc 20

<210> 37  
 <211> 28  
 <212> DNA  
 <213> Homo sapiens

<400> 37  
 ttccccctac ttccttctta tatctggc 28

<210> 38  
 <211> 27  
 <212> DNA  
 <213> Homo sapiens

<400> 38  
 atcctcactc caccctatga tctcatc 27

<210> 39  
 <211> 24  
 <212> DNA  
 <213> Homo sapiens



<400> 39 atggtcttta cttctccctg gcac	24
<210> 40 <211> 29 <212> DNA <213> Homo sapiens	
<400> 40 acttctgcta agattacaga tacacactg	29
<210> 41 <211> 26 <212> DNA <213> Homo sapiens	
<400> 41 agttctttca ggtttaagga ataagc	26
<210> 42 <211> 28 <212> DNA <213> Homo sapiens	
<400> 42 tagatctaag tggatctcat tatagcag	28
<210> 43 <211> 25 <212> DNA <213> Homo sapiens	
<400> 43 acttggggta atttaagtgg tgctc	25
<210> 44 <211> 27 <212> DNA <213> Homo sapiens	
<400> 44 aactttacac actccactga aatctcc	27
<210> 45 <211> 21 <212> DNA <213> Homo sapiens	
<400> 45 attaaacagg ggaattccga c	21

<210> 46  
 <211> 21  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 46  
 tctccaatt gtgttcatt g 21  
  
 <210> 47  
 <211> 19  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 47  
 acatccatgg atcccgaag 19  
  
 <210> 48  
 <211> 23  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 48  
 tggtatgaga aaggggataa gtg 23  
  
 <210> 49  
 <211> 25  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 49  
 tgcaccagc attccttaga tttcc 25  
  
 <210> 50  
 <211> 20  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 50  
 accagactca tgcccgaag 20  
  
 <210> 51  
 <211> 23  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 51  
 aaatgacgcc atctcatcac tcc 23  
  
 <210> 52

<211> 24	
<212> DNA	
<213> Homo sapiens	
<400> 52	
tgttttcctg gcatctacga gaag	24
<210> 53	
<211> 17	
<212> DNA	
<213> Homo sapiens	
<400> 53	
tttttaacag tcacacc	17
<210> 54	
<211> 17	
<212> DNA	
<213> Homo sapiens	
<400> 54	
tgtgtttcag atttgcc	17
<210> 55	
<211> 17	
<212> DNA	
<213> Homo sapiens	
<400> 55	
ttttgggcag ccatata	17
<210> 56	
<211> 17	
<212> DNA	
<213> Homo sapiens	
<400> 56	
taaaccatag ggttcga	17
<210> 57	
<211> 17	
<212> DNA	
<213> Homo sapiens	
<400> 57	
ctcattgcag cataaag	17
<210> 58	
<211> 17	
<212> DNA	
<213> Homo sapiens	

<400> 58 ttttttcagg cctcttc	17
<210> 59 <211> 17 <212> DNA <213> Homo sapiens	
<400> 59 tatttttaag atttaca	17
<210> 60 <211> 17 <212> DNA <213> Homo sapiens	
<400> 60 ggatttccag caacagg	17
<210> 61 <211> 17 <212> DNA <213> Homo sapiens	
<400> 61 acgccaagta agggggc	17
<210> 62 <211> 17 <212> DNA <213> Homo sapiens	
<400> 62 gcaggagggtt tgtatgt	17
<210> 63 <211> 17 <212> DNA <213> Homo sapiens	
<400> 63 ttgttgagta agtgtct	17
<210> 64 <211> 17 <212> DNA <213> Homo sapiens	
<400> 64 ggaataggta ggctctt	17

<210> 65  
 <211> 17  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 65  
 agaatgggta agcgctt 17  
  
 <210> 66  
 <211> 17  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 66  
 gaatgtgtga gtgttcc 17  
  
 <210> 67  
 <211> 17  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 67  
 cccatcggtg ggtttga 17  
  
 <210> 68  
 <211> 17  
 <212> DNA  
 <213> Homo sapiens  
  
 <400> 68  
 gtccatggta agagaac 17  
  
 <210> 69  
 <211> 30  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Synthetic  
 Peptide  
  
 <400> 69  
 Leu Pro Pro Gly Trp Glu Glu Arg Thr Thr Lys Asp Gly Trp Val Tyr  
 1 5 10 15  
 Tyr Ala Asn His Thr Glu Glu Lys Thr Gln Trp Glu His Pro  
 20 25 30  
  
 <210> 70  
 <211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 70

Leu	Pro	Tyr	Gly	Trp	Glu	Gln	Glu	Thr	Asp	Glu	Asn	Gly	Gln	Val	Phe
1				5				10						15	

Phe	Val	Asp	His	Ile	Asn	Lys	Arg	Thr	Thr	Tyr	Leu	Asp	Pro
			20					25					30